Lens Cover (Included)

Lenses

The NI High-Performance Smart Cameras have a C lens mount. National Instruments offers a number of C mount lenses. These lenses include both low and high resolution options to accommodate the different camera models.

NI 1772, 1772C, NI 1774, NI 1774C	
Computar M0814-MP, 8mm, F1.4, Megapixel	780024-01
Computar M1214-MP, 12mm, F1.4, Megapixel	780025-01
Computar M1614-MP, 16mm, F1.4, Megapixel	780026-01
Computar M2514-MP, 25mm, F1.4, Megapixel	780027-01
Computar M3514-MP, 35mm, F1.4, Megapixel	780033-01
NI 1776, NI 1776C, NI 1778	
Computar M1620-MPV, 16mm, F2.0,2/3 inch, 3MP	782023-01
Computar M2518-MPV, 25mm,F1.8, 2/3 inch, 3MP	782024-01
Computar M3520-MPV, 35mm, F2.0,2/3 inch, 3MP	782025-01
Fujinon HF12.5SA-1, 12.5mm, F1.4, 5 MP	782525-01
Fujinon HF16SA-1, 16mm, F1.4, 5 MP	782424-01
Fujinon HF25A-1, 25mm, F1.4, 5 MP	782423-01

Ethernet

Utilize Ethernet for enterprise connectivity, Modbus, EtherNet/IP, and TCP/IP.

M12 Ethernet Connector	
M12 to RJ45 Cable (5m)	153130-05

USB and VGA Video

View inspection images and connect additional storage via USB.

M12 VGA and USB Connector	
M12 to VGA/USB Splitter Cable (1m)	153064-01

NI 177x Smart Camera Accessories

Mounting and Lighting

Utilize industry standard mounting for the following mount and lighting options:

Mounting	
Tripod Adaptor	199173-01
Pan and Tilt Mount	748182-02
Light Bracket for 177x Smart Cameras	782570-01
Lighting for Monochrome Cameras	
Advanced Illumination RL127, Red Ring Light	782026-01
Lighting for Color Cameras	
Advanced Illumination RL127, White Ring Light	782027-01

Power and I/O

There are two main options for connecting power and I/O to the camera.

The first is to use the starter kit for NI 177x Smart Cameras. The starter kit includes all accessories listed in the table, and is the easiest way to start using the NI 177x Smart Camera.

Starter Kit for NI 177x Smart Cameras	782043-01
Power & I/O Accessory	
Power Supply	
M12 to DSUB cable for Power & I/O Accessory	
M12 to RJ45 cable	
M12 to VGA/USB cable	

The second option is to use the following M12 to Pigtail cable. This cable provides a way to connect the smart camera power and I/O lines to custom termination. The Power Supply for NI 177x Smart Cameras can also be connected to custom termination utilizing the M12 to Pigtail cable to connect to the Smart Camera.

Cable	
M12 to Pigtail cable (3m)	153131-03
Power Supply	
Power Supply for NI 177x Smart Cameras	782032-01

1

Lens Cover

The lens cover protects the smart camera lens from dust and damage and is rated for IP67. The lens cover keeps the aperture and focus settings from being changed. The following figures show the dimensions of the lens cover included with the NI 177x Smart Camera.

Figure 1-1. Lens Cover Dimensional Drawing

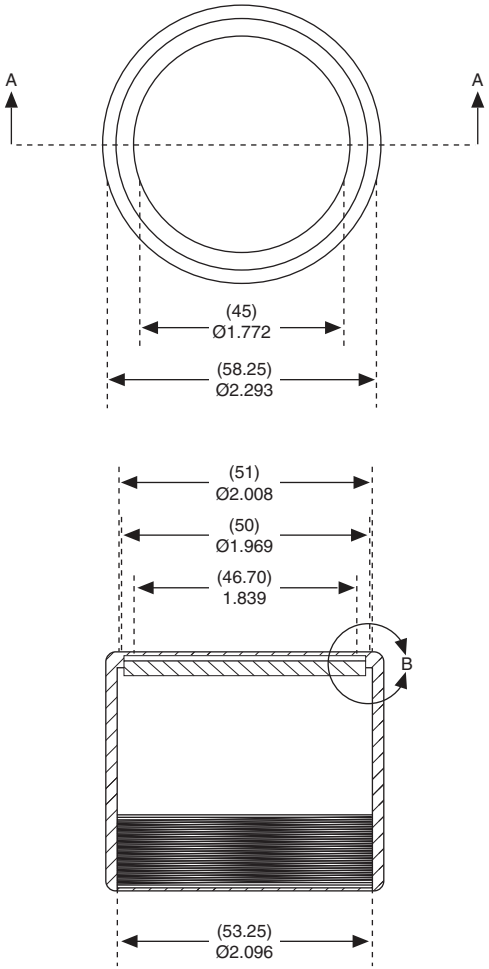
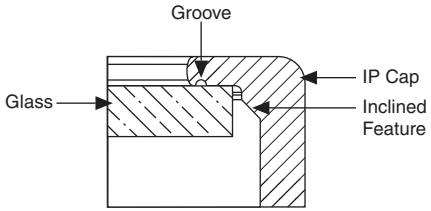


Figure 1-2. Detailed View of Lens Cover



Lens Cover Physical Characteristics

Material ..... Aluminum alloy 6061-T6

Finish ..... Black anodic coating, per MIL-A-8625F, Type II, class 2

The glass window is glued to the IP cap using one component UV cure adhesive.

2

Lenses

National Instruments offers low and high resolution lenses to accommodate the different NI 177x Smart Cameras. All lenses are 2/3 inch and C mount. Refer to the following pages for detailed specifications about each lens.

Table 2-1. Lenses for NI 1772, NI 1772C, NI 1774, and NI 1774C Smart Cameras

Model	Focal Length (mm)	Aperture	Dimensions (mm)	Weight (g)
Computar M0814-MP	8	F1.4—F16C	33.5 x 28.2	70
Computar M1214-MP	12	F1.4—F16C	33.5 x 28.2	65
Computar M1614-MP	16	F1.4—F16C	33.5 x 28.2	65
Computar M2514-MP	25	F1.4—F16C	33.5 x 36	75
Computar M3514-MP	35	F1.4—F16C	33.5 x 38.2	87

Table 2-2. Lenses for NI 1776, NI 1776C, and NI 1778 Smart Cameras

Model	Focal Length (mm)	Aperture	Dimensions (mm)	Weight (g)
Computar M1620-MPV	16	F2.0—F16.0	29 x 33.53	53
Computar M2518-MPV	25	F1.8—F16.0	29 x 36.7	60
Computar M3520-MPV	35	F2.0—F22.0	29 x 37.34	59
Fujinon HF12.5SA-1	12.5	F1.4—F22	83 x 62	295

Model	Focal Length (mm)	Aperture	Dimensions (mm)	Weight (g)
Fujinon HF16SA-1	16	F1.4—F22	69 x 51	285
Fujinon HF25SA-1	25	F1.4—F22	44 x 33	315

M0814-MP

8mm F1.4

for 2/3" format cameras

C-Mount

2/3

Model No.		M0814-MP	**Effective**	**Front**	f 21.5mm	
Focal Length		8mm	**Lens Aperture**	**Rear**	f 12.0mm	
Max. Aperture Ratio		1 : 1.4	**Distortion**		-1.1%(y=4.0)	
Max. Image Format		8.8 x 6.6mm (f11mm)	**Back Focal Length**		13.1mm	
Operation Range	**Iris**	F1.4 - 16C	**Flange Back Length**		17.526mm	
	Focus	0.3m - Inf.	**Mount**		C-Mount	
Control	**Iris**	Manual	**Filter Size**		M30.5 P=0.5mm	
	Focus	Manual	**Dimensions**		f33.5 x 28.2mm	
Object Dimension at M.O.D.		32.1 x 24.1cm	**Weight**		70g	

C

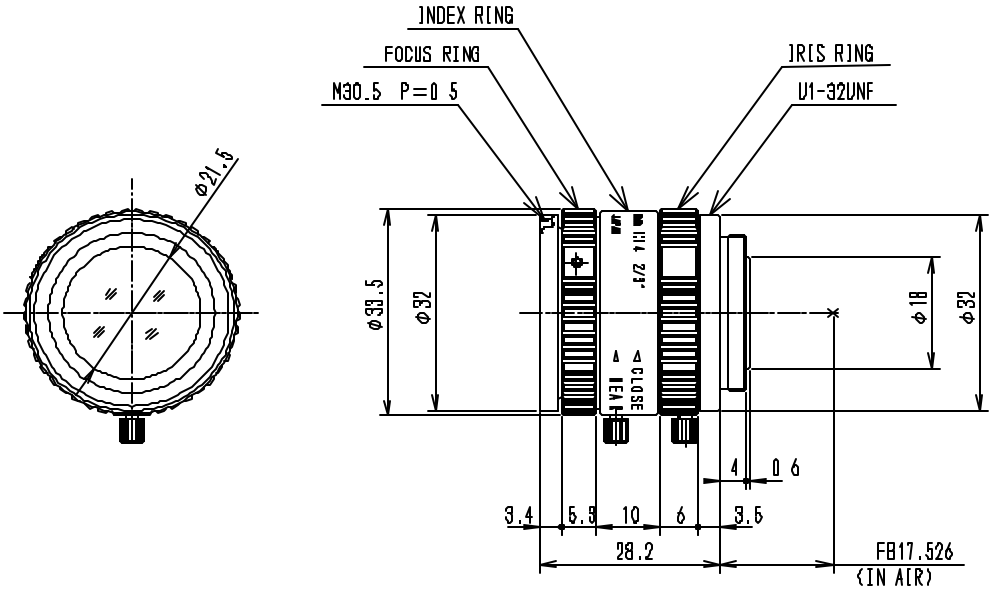
Angle of View	**D**	2/3"	67.1°	1/2"	51.9°		
	H		56.3°		42.5°		
	V		43.7°		32.4°		

Operating Temperature	-20°C ~ +50°C

M.O.D. : Minimum Object Distance

F

Dimensions



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M1214-MP

12mm F1.4

for 2/3" format cameras

C-Mount

2/3

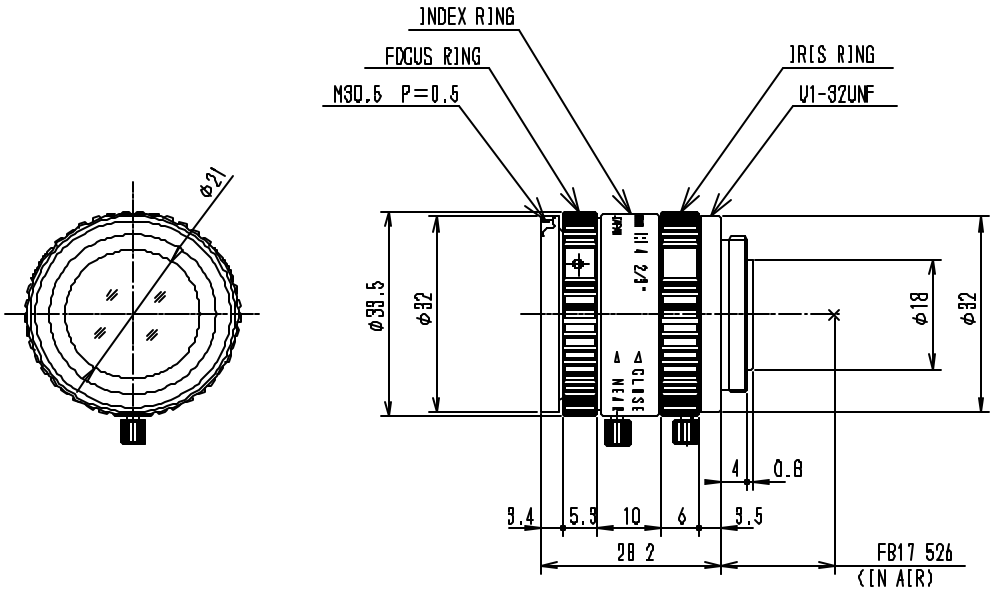
Model No.		M1214-MP		**Effective**	**Front**	f 21.0mm	
Focal Length		12mm		**Lens Aperture**	**Rear**	f 13.0mm	
Max. Aperture Ratio		1 : 1.4		**Distortion**		-0.35%(y=4.0)	
Max. Image Format		8.8 x 6.6mm (f11mm)		**Back Focal Length**		13.1mm	
Operation Range	**Iris**	F1.4 - 16C		**Flange Back Length**		17.526mm	
	Focus	0.3m - Inf.		**Mount**		C-Mount	
Control	**Iris**	Manual		**Filter Size**		M30.5 P=0.5mm	
	Focus	Manual		**Dimensions**		f33.5 x 28.2mm	
Object Dimension at M.O.D.		22.1 x 16.5cm		**Weight**		65g	
Angle of View	**D**	2/3"	49.2°	1/2"	37.0°		
	H		40.4°		30.0°		
	V		30.8°		22.7°		
Operating Temperature		-20°C ~ +50°C					

C

M.O.D. : Minimum Object Distance

Dimensions

F



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M1614-MP

16mm F1.4

for 2/3" format cameras

C-Mount

2/3

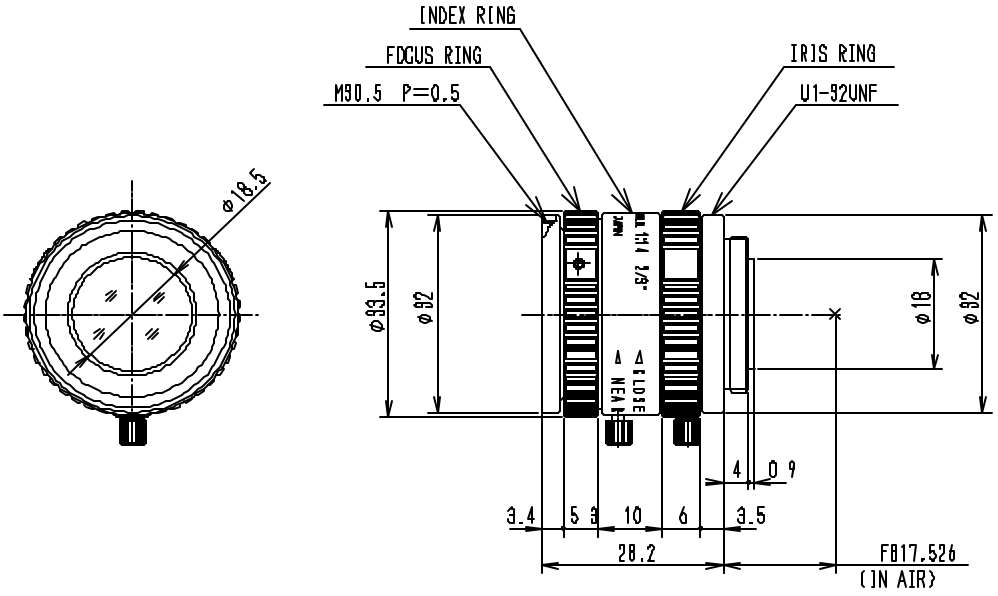
Model No.		M1614-MP		**Effective**	**Front**	f 18.5mm	
Focal Length		16mm		**Lens Aperture**	**Rear**	f 13.2mm	
Max. Aperture Ratio		1 : 1.4		**Distortion**		-0.3%(y=4.0)	
Max. Image Format		8.8 x 6.6mm (f11mm)		**Back Focal Length**		13.1mm	
Operation Range	**Iris**	F1.4 - 16C		**Flange Back Length**		17.526mm	
	Focus	0.3m - Inf.		**Mount**		C-Mount	
Control	**Iris**	Manual		**Filter Size**		M30.5 P=0.5mm	
	Focus	Manual		**Dimensions**		f33.5 x 28.2mm	
Object Dimension at M.O.D.		16.5 x 12.4cm		**Weight**		65g	
Angle of View	**D**	2/3"	38.0°	1/2"	28.2°		
	H		30.8°		22.7°		
	V		23.4°		17.1°		
Operating Temperature		-20°C ~ +50°C					

C

M.O.D. : Minimum Object Distance

Dimensions

F



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M2514-MP

25mm F1.4

for 2/3" format cameras

C-Mount

2/3

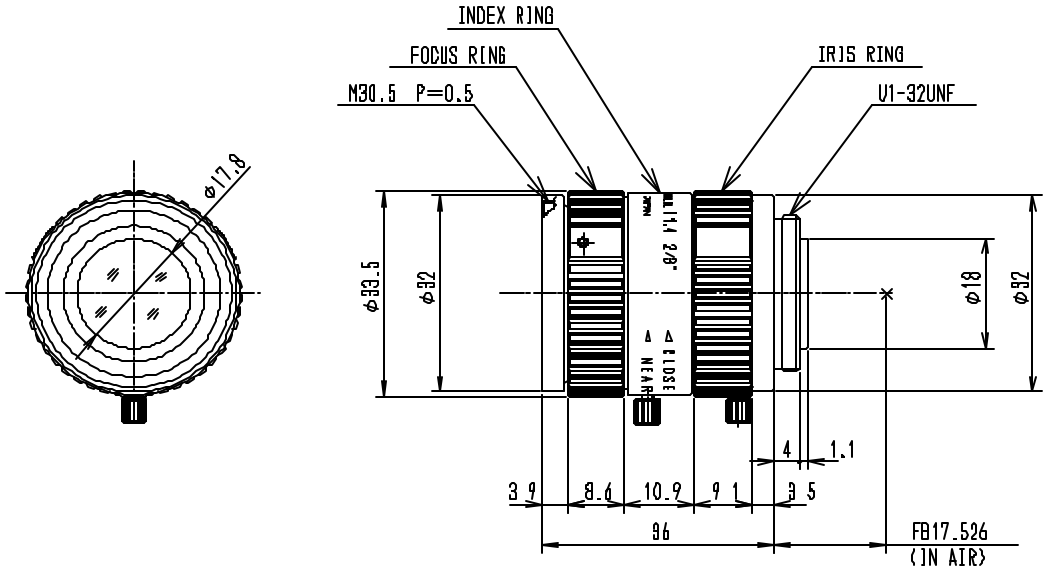
Model No.		M2514-MP		**Effective**	**Front**	f 17.8mm	
Focal Length		25mm		**Lens Aperture**	**Rear**	f 12.0mm	
Max. Aperture Ratio		1 : 1.4		**Distortion**		-0.1%(y=4.0)	
Max. Image Format		8.8 x 6.6mm (f11mm)		**Back Focal Length**		13.1mm	
Operation Range	**Iris**	F1.4 - 16C		**Flange Back Length**		17.526mm	
	Focus	0.3m - Inf.		**Mount**		C-Mount	
Control	**Iris**	Manual		**Filter Size**		M30.5 P=0.5mm	
	Focus	Manual		**Dimensions**		f33.5 x 36.0mm	
Object Dimension at M.O.D.		10.6 x 8.0cm		**Weight**		75g	
Angle of View	**D**	2/3"	24.9°	1/2"	18.2°		
	H		20.0°		14.6°		
	V		15.1°		11.0°		
Operating Temperature		-20°C ~ +50°C					

C

M.O.D. : Minimum Object Distance

Dimensions

F



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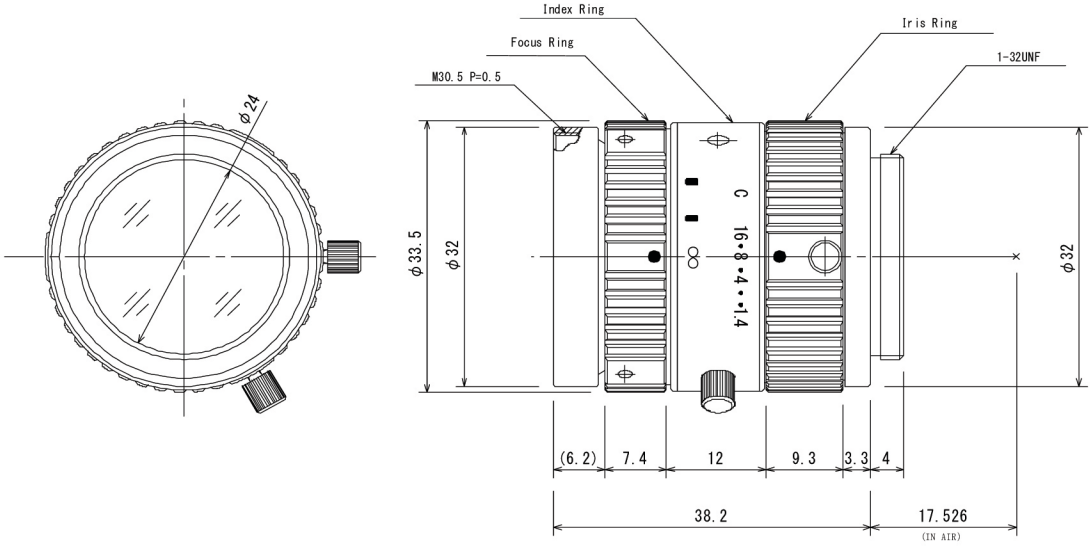
M3514-MP

f=35mm F1.4
for 2/3 type Megapixel Cameras
C-Mount

Model No.		M3514-MP		Effective Lens Aperture	Front	φ24mm	
Focal Length		35mm			Rear	φ12mm	
Max. Aperture Ratio		1:1.4		Distortion	2/3 type	-0.8%(y=5.5)	
Max. Image Format		8.8mm x 6.6mm(φ11mm)			1/2 type	-0.39%(y=4.0)	
Operation Range	Iris	F1.4 - F16C		Back Focal Length		17.1mm	
	Focus	0.3m - Inf.		Flange Back Length		17.526mm	
Control	Iris	Manual		Mount		C-Mount	
	Focus	Manual		Filter Size		M30.5 P=0.5mm	
Object Dimension	2/3 type	8.1cm x 6cm		Dimensions		φ33.5mm x 38.2mm	
at M.O.D	1/2 type	5.9cm x 4.4cm		Weight		87g	
Angle of View	D	2/3 type	17.3°	1/2 type	12.6°		
	H		13.9°		10.1°		
	V		10.4 °		7.6°		
Operating Temperature		-10℃ - +50℃					

M.O.D : Minimum Object Distance

Dimensions



Specifications are subject to change without notice.

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computar

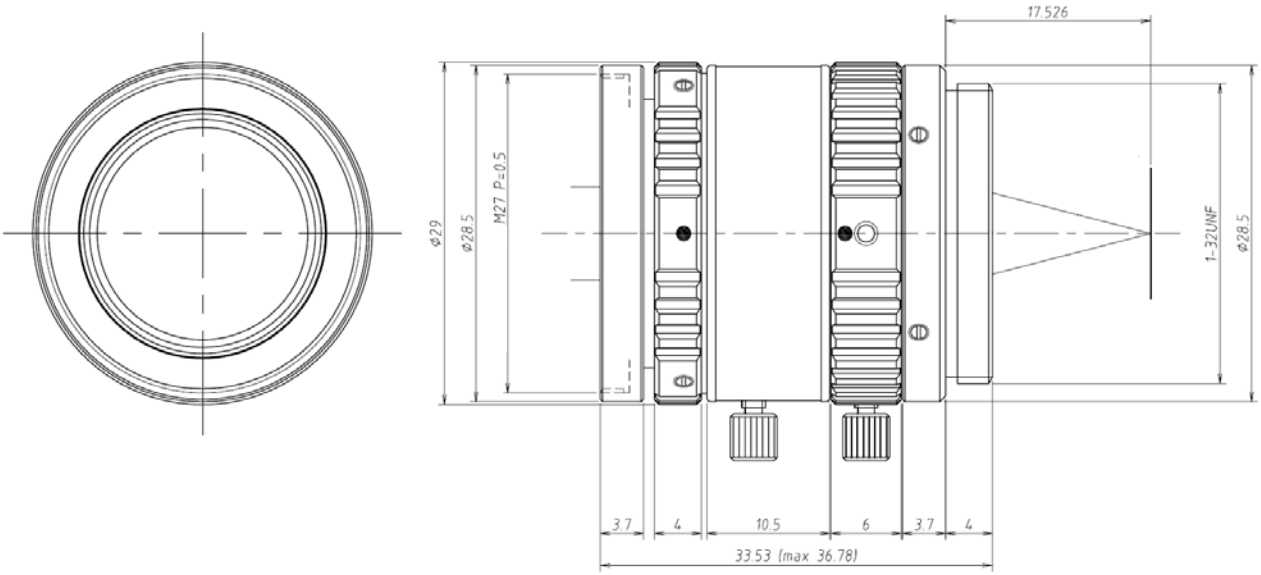
M1620-MPV

f=16mm F2.0
for 2/3 type Cameras, 3 Megapixel
C-Mount

Model No.		M1620-MPV		Effective	Front	φ18.0mm	
Focal Length		16mm		Lens Aperture	Rear	φ11.0mm	
Max. Aperture Ratio		1:2.0		Distortion	2/3 type	0.09%(y=5.5)	
Max. Image Format		8.8mm x 6.6mm(φ11mm)			1/1.8 type	-0.06%(y=4.32)	
Operation Range	Iris	F2.0 - F16.0			1/2 type	-0.07%(y=4.0)	
	Focus	0.2m - Inf.		Back Focal Length		14.7mm	
Control	Iris	Manual		Flange Back Length		17.526mm	
	Focus	Manual		Mount		C-Mount	
Object Dimension at M.O.D.	2/3 Type	8.8cm x 11.74cm		Filter Size		M27.0 P=0.5mm	
	1/1.8 Type	6.93cm x 9.20cm		Dimensions		φ29mm x 33.53mm	
	1/2 Type	6.40cm x 8.53cm		Weight		53.0g	
Angle of View	D	2/3 Type	37.7°	1/1.8 Type	30.1°	1/2 Type	28.0°
	H		30.7°		24.3°		22.6°
	V		23.3°		18.5°		17.1°
Operating Temperature		-10℃ - +50℃					

M.O.D. : Minimum Object Distance

Dimensions



computar

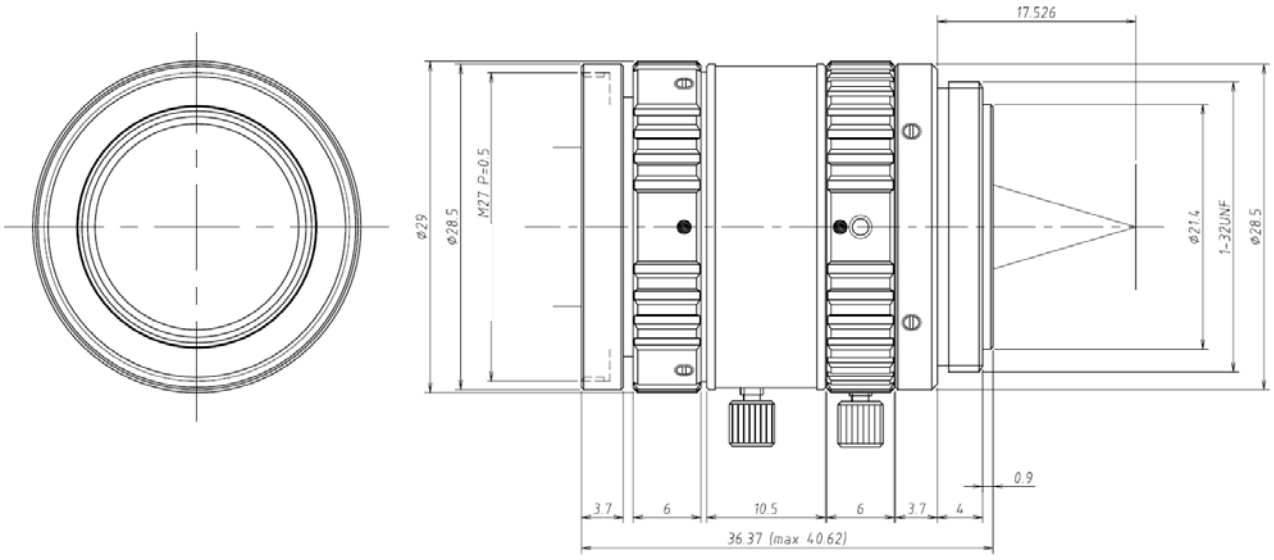
M2518-MPV

f=25mm F1.8
for 2/3 type Cameras, 3 Megapixel
C-Mount

Model No.		M2518-MPV		Effective	Front	φ18.0mm	
Focal Length		25mm		Lens Aperture	Rear	φ13.0mm	
Max. Aperture Ratio		1:1.8		Distortion	2/3 type	0.03%(y=5.5)	
Max. Image Format		8.8mm x 6.6mm(φ11mm)			1/1.8 type	-0.02%(y=4.32)	
Operation Range	Iris	F1.8 - F16.0			1/2 type	-0.02%(y=4.0)	
	Focus	0.2m - Inf.		Back Focal Length		13.8mm	
Control	Iris	Manual		Flange Back Length		17.526mm	
	Focus	Manual		Mount		C-Mount	
Object Dimension at M.O.D.	2/3 Type	5.48cm x 7.31cm		Filter Size		M27.0 P=0.5mm	
	1/1.8 Type	4.32cm x 5.73cm		Dimensions		φ29mm x 36.37mm	
	1/2 Type	3.98cm x 5.31cm		Weight		60.0g	
Angle of View	D	2/3 Type	24.6°	1/1.8 Type	19.5°	1/2 Type	18.1°
	H		19.9°		15.7°		14.5°
	V		15.0°		11.8°		10.9°
Operating Temperature		-10℃ - +50℃					

M.O.D. : Minimum Object Distance

Dimensions



computar

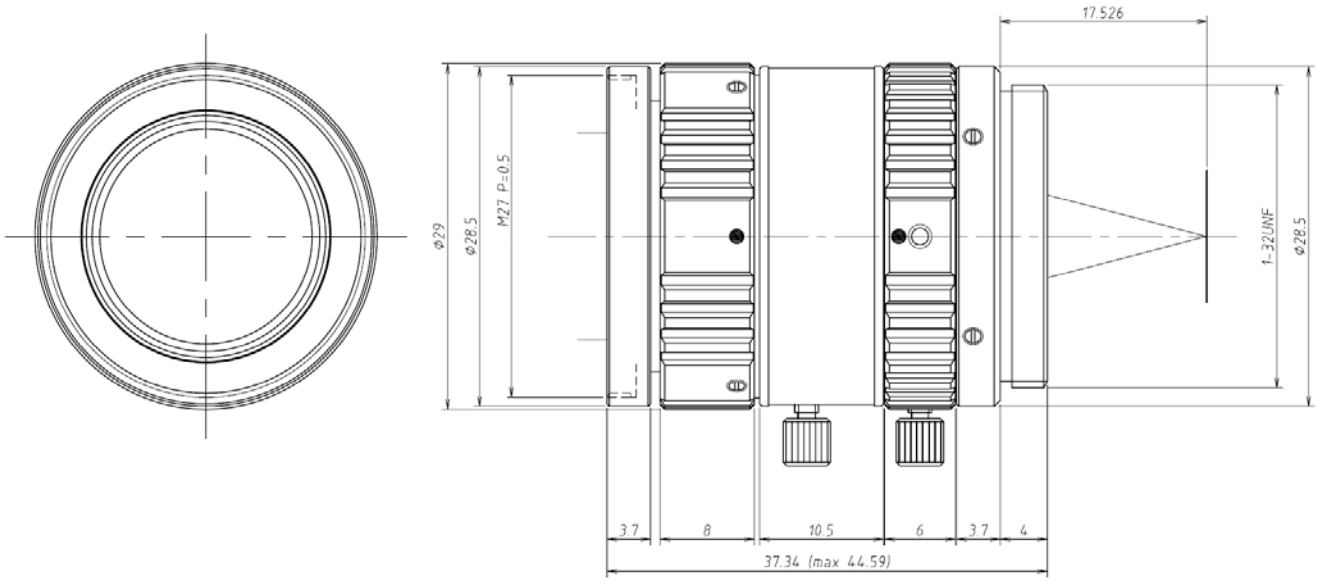
M3520-MPV

f=35mm F2.0
for 2/3 type Cameras, 3 Megapixel
C-Mount

Model No.		M3520-MPV		Effective	Front	φ18.0mm	
Focal Length		35mm		Lens Aperture	Rear	φ12.0mm	
Max. Aperture Ratio		1:2.0		Distortion	2/3 type	0.011%(y=5.5)	
Max. Image Format		8.8mm x 6.6mm(φ11mm)			1/1.8 type	0.010%(y=4.32)	
Operation Range	Iris	F2.0 - F22.0			1/2 type	0.009%(y=4.0)	
	Focus	0.2m - Inf.		Back Focal Length		18.0mm	
Control	Iris	Manual		Flange Back Length		17.526mm	
	Focus	Manual		Mount		C-Mount	
Object Dimension at M.O.D.	2/3 Type	3.48cm x 4.63cm		Filter Size		M27.0 P=0.5mm	
	1/1.8 Type	2.74cm x 3.63cm		Dimensions		φ29mm x 37.34mm	
	1/2 Type	2.53cm x 3.37cm		Weight		59.0g	
Angle of View	D	2/3 type	17.8°	1/1.8 tyoe	14.0°	1/2 type	13.0°
	H		14.3°		11.2°		10.4°
	V		10.7°		8.5°		7.8°
Operating Temperature		-10℃ - +50℃					

M.O.D. : Minimum Object Distance

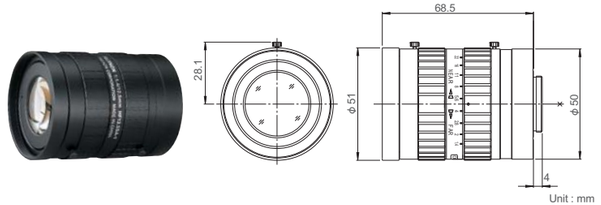
Dimensions



For FA/Machine Vision Fixed Focal

HF12.5SA-1

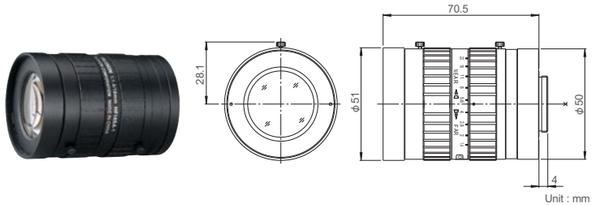
FIXED 5 Mega MANUAL C-mt METAL F1.4



Unit : mm

HF16SA-1

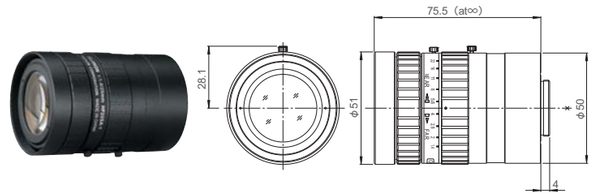
FIXED 5 Mega MANUAL C-mt METAL F1.4



Unit : mm

HF25SA-1

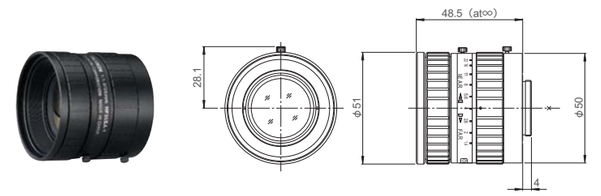
FIXED 5 Mega MANUAL C-mt METAL F1.4



Unit : mm

HF35SA-1

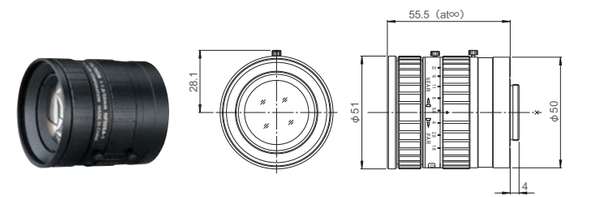
FIXED 5 Mega MANUAL C-mt METAL F1.4



Unit : mm

HF50SA-1

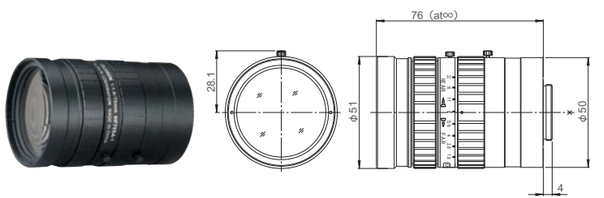
FIXED 5 Mega MANUAL C-mt METAL



Unit : mm

HF75SA-1

FIXED 5 Mega MANUAL C-mt METAL



Unit : mm

Feature Indications

FIXED — Fixed Focal
High performance single focal lens for the best image quality

MANUAL — Manual Iris
Manually-operated iris

F1.4 — Wide Aperture Rate
Lens with the wide aperture rate, optimizing the sensitivity of cameras

5 Mega — For Megapixel Camera
For 5 Megapixel Camera

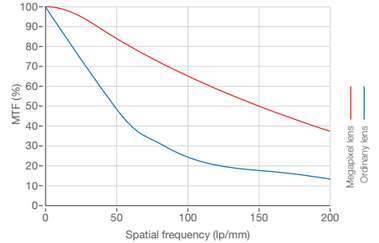
C-mt — C Mount
Screw-in mounting commonly used in FA lenses

METAL — Metal Mount
Metal mounting with high accuracy and durability

- ··· With locking knob for iris and focus
- ··· Using an extension tube longer than 5mm the M.O.D. will increase to 0.3m
- ··· Using an extension tube longer than 5mm the M.O.D. will increase to 0.5m

Megapixel Supporting Lens

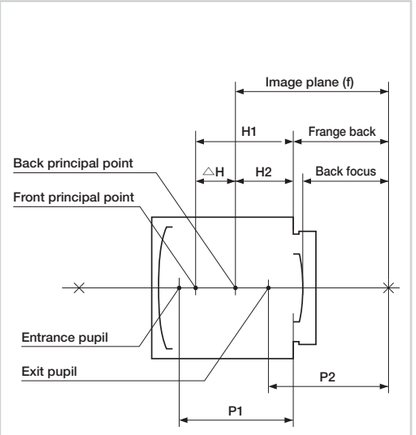
We have realized a high resolution, compact, and lightweight lens supporting to megapixel by thoroughly reducing aberrations based on design technology cultivated from broadcast TV lenses.
The chart shown at the right compares megapixel supporting lens and the MTF of an ordinary CCTV lens.
As the number of TV lines increases, the disparity in MTF becomes bigger.



		HF12.5SA-1	HF16SA-1	HF25SA-1	HF35SA-1	HF50SA-1	HF75SA-1
Focal Length (mm)		12.5	16	25	35	50	75
Iris Range		F1.4~F22	F1.4~F22	F1.4~F22	F1.4~F22	F1.8~F22	F1.8~F22
Operation	Focus	Manual	Manual	Manual	Manual	Manual	Manual
	Iris	Manual	Manual	Manual	Manual	Manual	Manual
Angle Of View (H×V)	2/3"	38°47' × 29°35'	30°45' × 23°18'	19°58' × 15°02'	14°20' × 10°46'	10°03' × 7°33'	6°43' × 5°02'
	1/2"	28°43' × 21°44'	22°37' × 17°04'	14°35' × 10°58'	10°27' × 7°51'	7°19' × 5°30'	4°53' × 3°40'
	1/3"	21°44' × 16°23'	17°04' × 12°50'	10°58' × 8°14'	7°51' × 5°53'	5°30' × 4°07'	3°40' × 2°45'
Focusing Range (From Front Of The Lens) (m)		∞ ~ 0.1	∞ ~ 0.1	∞ ~ 0.1	∞ ~ 0.2	∞ ~ 0.4	∞ ~ 0.9
Object Dimensions at M.O.D. (H×V) (mm)	2/3"	83 × 62	69 × 51	44 × 33	50 × 38	70 × 52	101 × 76
	1/2"	60 × 45	50 × 37	32 × 24	37 × 27	51 × 38	74 × 55
	1/3"	45 × 34	37 × 28	24 × 18	27 × 21	38 × 28	55 × 41
Back Focal Distance (in air) (mm)		16.07	17.99	22.32	14.99	17.81	24.43
Exit Pupil Position (From Image Plane) (mm)		-101	-172	-140	-37	-49	-52
Filter Thread (mm)		M49 × 0.75	M49 × 0.75	M49 × 0.75	M49 × 0.75	M49 × 0.75	M49 × 0.75
Mount		C	C	C	C	C	C
Mass (g)		295	285	315	185	240	305
Remarks		With Metal Mount	With Metal Mount	With Metal Mount	With Metal Mount	With Metal Mount	With Metal Mount

OPTICAL DATA (FA/Machine Vision LENS)

Sensor size	Product name	Focal Length	Aperture/Full open	Front principal point H_1 (from Mount)	Back principal point H_2 (from Mount)	Distance between the pincipal points △H	Entrance pupil position P_1 (from Mount)	Exit pupil position P_2 (from Image plane)	Back focal distance (in air)	Distortion	Relative illumination (Aperture: at full open. Image height: at diagonal)
1/2"	DF6HA-1B	6.15	1.2	-16.45	11.38	27.82	-21.8	-46	11.44	-1.93%	39
2/3"	HF9HA-1B	9.23	1.4	-12.91	8.30	21.21	-19.1	-28	13.48	-2.09%	32
	HF12.5HA-1B	12.88	1.4	-2.85	4.64	7.49	-10.3	-31	15.09	-2.01%	35
	HF16HA-1B	16.49	1.4	3.05	1.03	-2.02	-4.5	-30	15.15	-0.96%	35
	HF25HA-1B	25.81	1.4	1.82	-8.28	-10.10	-3.0	-32	14.58	-0.27%	46
	HF35HA-1B	34.99	1.6	-9.00	-17.47	-8.46	2.1	-27	15.00	0.03%	56
	HF50HA-1B	49.57	2.3	-42.64	-32.04	10.59	5.8	-25	15.25	0.04%	61
	HF75HA-1B	75.01	2.8	-100.77	-57.48	43.29	35.4	-27	15.75	0.27%	63
	HF12.5SA-1	12.83	1.4	-33.68	4.70	38.37	-44.9	-101	16.07	-0.30%	68
	HF16SA-1	16.33	1.4	-24.15	1.20	25.35	-38.9	-172	17.99	-0.08%	78
	HF25SA-1	24.00	1.4	-23.47	-6.47	17.00	-43.3	-139	22.32	-0.18%	72
	HF35SA-1	35.74	1.4	-1.27	-18.21	-16.94	-2.1	-37	14.99	-0.07%	62
	HF50SA-1	51.72	1.8	-1.87	-34.19	-32.32	0.5	-49	17.81	-0.03%	75
	HF75SA-1	74.97	1.8	-34.56	-57.45	-22.89	-2.2	-52	24.43	-0.03%	72
	HF35SR4A-SA1L	35.00	2.0	-19.33	-17.47	1.85	-37.8	-74	19.65	-0.02%	74
	HF50SR4A-SA1L	50.00	2.8	18.09	-32.47	-50.56	-26.7	-484	19.16	0.07%	80
1"	CF12.5HA-1	12.83	1.4	-33.68	4.70	38.37	-44.9	-101	16.07	0.17%	40
	CF16HA-1	16.33	1.4	-24.15	1.20	25.35	-38.9	-172	17.99	0.31%	34
	CF25HA-1	24.00	1.4	-23.47	-6.47	17.00	-43.3	-139	22.32	0.02%	39
	CF35HA-1	35.74	1.4	-1.27	-18.21	-16.94	-2.1	-37	14.99	-0.15%	43
	CF50HA-1	51.72	1.8	-1.87	-34.19	-32.32	0.5	-49	17.81	-0.06%	62
	CF75HA-1	74.97	1.8	-34.56	-57.45	-22.89	-2.2	-52	24.43	-0.06%	67
1/3" (3CCD)	TF2.8DA-8	2.86	2.2	-33.74	14.67	48.41	-36.7	101	14.51	-6.25%	51
	TF4DA-8	4.15	2.2	-28.46	13.37	41.83	-32.8	88	14.61	-3.78%	53
	TF8DA-8B	8.23	2.2	-10.81	9.30	20.10	-18.6	-178	14.83	-1.32%	30
	TF15DA-8	15.26	2.2	-0.33	2.27	2.60	-12.9	-89	16.32	-0.33%	34
	TF25DA-8B	24.94	2.2	14.49	-7.42	-21.91	-5.1	-120	15.12	-0.12%	30
Fish-Eye	FE185C046HA-1	1.43	1.4	-38.26	16.10	54.36	-39.7	-227	9.70	-0.47% ※	75
	FE185C057HA-1	1.78	1.4	-37.55	15.75	53.30	-39.3	-66	9.70	-0.80% ※	74
	FE185C086HA-1	2.68	1.8	-35.00	14.85	49.85	-37.5	-41	9.75	-0.53% ※	84



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3

M12 to RJ45 Cable

Use the M12 to RJ45 cable to connect the NI 177x Smart Camera to the development computer. The cable is 5 meters long.

Figure 3-1. M12 to RJ45 Cable

M12 to Ethernet Cable Specifications

Mechanical Characteristics

Number of positions	8
Shielded	Yes
Cable diameter	6.40 mm
Cable exit	Straight
Cable structure	4x2xAWG26/7; S-FTP
Smallest bending radius, fixed installation min.	32 mm
Smallest bending radius, movable installation min.	32 mm (cable, flexible installation)
Ambient temperature (operation)	-25 °C to 60 °C (cable, fixed installation) -5 °C to 60 °C (cable, flexible installation)

Material Data

Inflammability class acc. to UL 94	HB
Outer sheath, material	PUR
External sheath, color	water blue RAL 5021

Line Characteristics

Conductor cross section	0.14 mm²
AWG signal line	26
Conductor structure signal line	7 x 0.16 mm
Core diameter including insulation	1 mm
External cable diameter	6.4 mm
Wire colors	White-blue, white-orange, white-green, white-brown
External sheath, color water blue	RAL 5021
Insulation resistance	≥ 5 GΩ*km
Conductor resistance	≤ 150 mΩ/m
Transmission characteristics (category)	CAT6A
Working capacitance	42 pF
Wave impedance	100 Ω ± 5% (at 100 MHz)
Signal speed	0.72 c
Signal runtime	46 ns/m
Shield attenuation	60 dB (Up to 1000 MHz)
Interference suppression	90 dB (Up to 1000 MHz)

Nominal voltage, conductor	125 V
Test voltage, conductor	1000 V
Twisted pairs	2 cores to the pair
Type of pair shielding	Aluminum-lined polyester foil
Overall twist	2 cores with 2 fillers to the core
Shielding	Tinned copper braided shield
Optical shield covering	65%
Outer sheath, material	PUR
Material conductor insulation	Cell PE
Conductor material	Bare Cu litz wires
Cable weight	44 kg/km
Smallest bending radius, fixed installation min.	32 mm
Smallest bending radius, movable installation min.	32 mm

4

M12 VGA/USB Cable

Use the M12 VGA/USB cable to view inspection images via a VGA monitor, and to connect addition storage via USB. Refer to the *NI 177x Smart Camera User Manual* for signal assignments. The cable is 1 meter long.

Figure 4-1. M12 to VGA/USB Splitter Cable

Figure 4-2. View of the VGA and USB Connectors

5

Mounting and Lighting

NI 177x Smart Cameras use industry-standard mounting and lighting.

Figure 5-1. Smart Camera with lens cover, light mounting bracket, and ring light

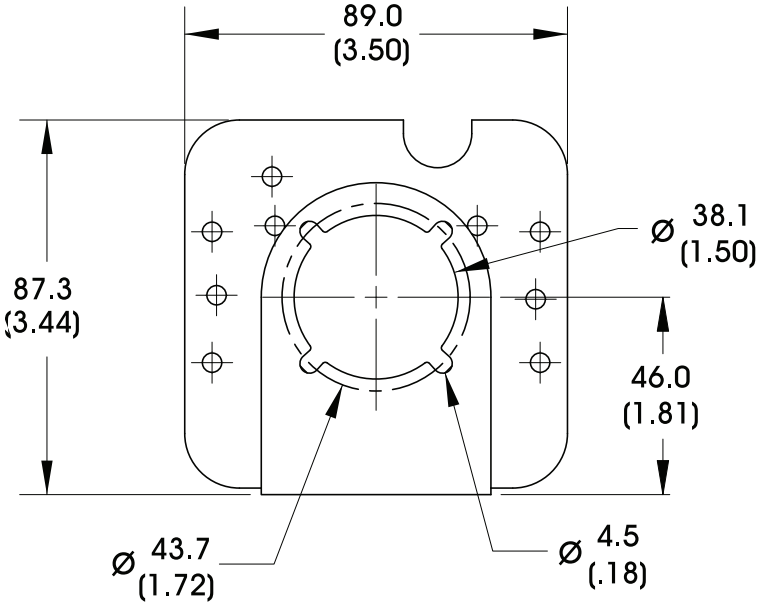
Lights

The lights for the NI 177x Smart Camera are manufactured by Advanced Illumination. Because the lights are current-driven light heads, you can connect the lights to smart cameras with built-in direct drive lighting controls. Refer to the following page for specifications for the RL 127 white ring light and RL 127 red ring light.

Light Mounting Bracket

Use the light mounting bracket to connect the Advanced Illumination ring lights to the NI 177x Smart Camera.

Figure 5-2. Light Mounting Bracket



Tripod Adapter and Pan and Tilt Mount

Refer to the following pages for the mechanical drawings for the tripod adapter and the pan and tilt mount.

RL127

High Brightness LED Ring Light

- Intense illumination in a compact (4.6” diameter) housing
- IP65 Compliant Design
- Axial light source designed for inspecting non-specular objects

Ordering Information

Standard Product:
Shipped Next Day

RL127-WHIIC

Configured with inline Current Source

RL127-WHIC5

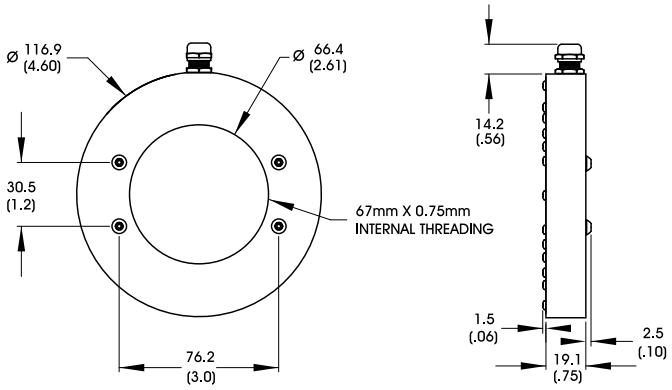
Configured for use with the Pulsar 320

Standard Product Variation:
Shipped Within Two Weeks

		Spectral wavelength	Optional power compatibility	Optional Light Conditioning	Alternative Connector
RL127	-	XXX	XX	X	XXX
		(blue) 470 (red) 625 (white) WHI	IC IS C2 C3 C5	P (Diffuser) D (Polarizer)	M12* (male)

IC = iCS (requires 24v power supply)
IS = iSU (requires 24v power supply)
C2 = Ai Connector
C5 = Pulsar 320 Connector
* Available with IC and IS options only

Dimensional Information



Click for Installation Models & Drawings

The RL127 can be mounted using brackets: LB101, LB103, or LB105 (not included)

Click for Brackets Spec Sheet

Cable Length: 1.5 Meter (59”)

Current Specifications

	blue	red	white	
@24	320	320	320	mA

Standard Product Information

Weight:	304 g (11 oz.)
Finish:	Black Anodized
Operating Temperature:	0-60° C
Meets Specifications:	CE, RoHS
Product Lifetime:	50,000 hours

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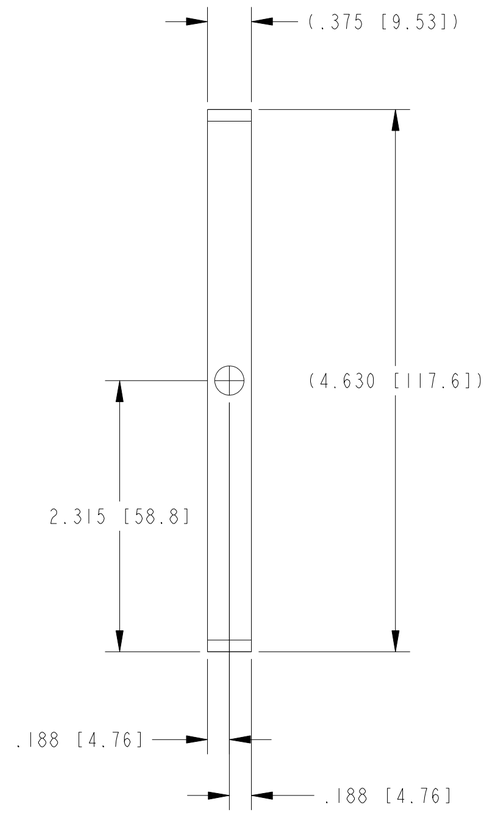

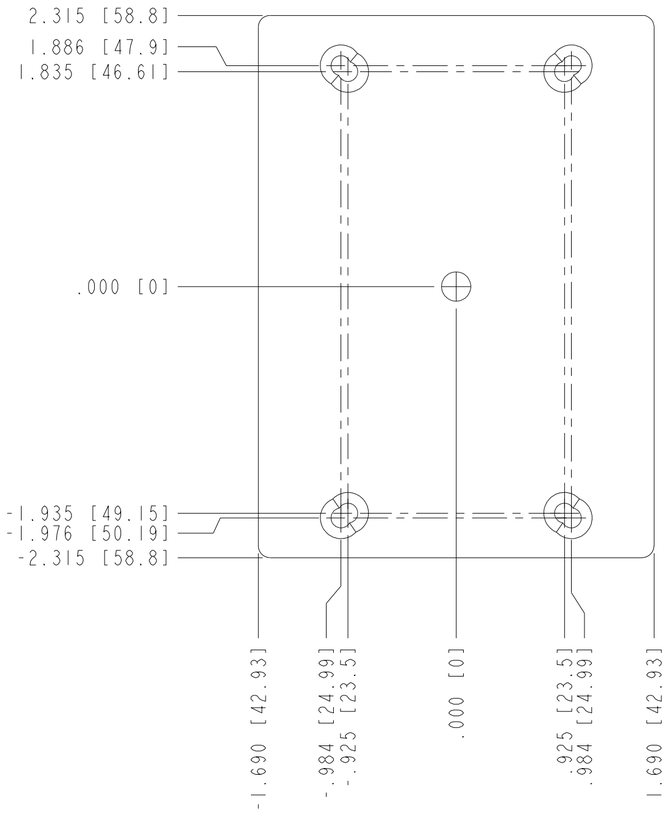

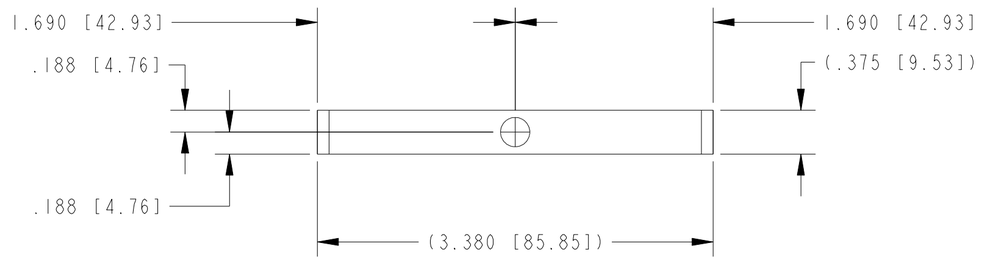

CUSTOMER DRAWING

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DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

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TITLE

NI-17XX SERIES SMART CAMERA TRIPOD ADAPTER PLATE

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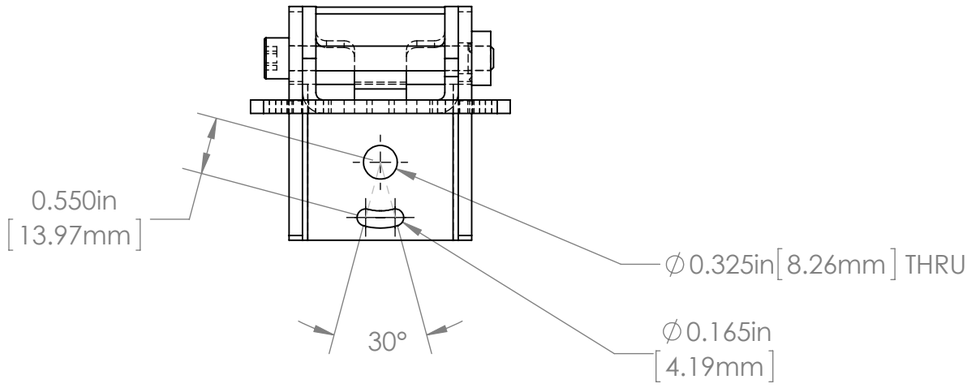
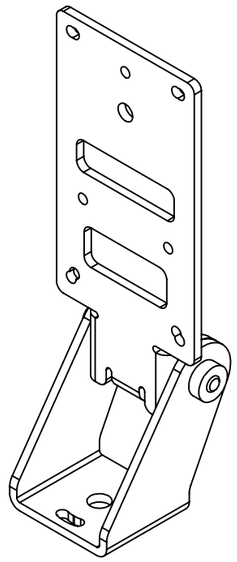
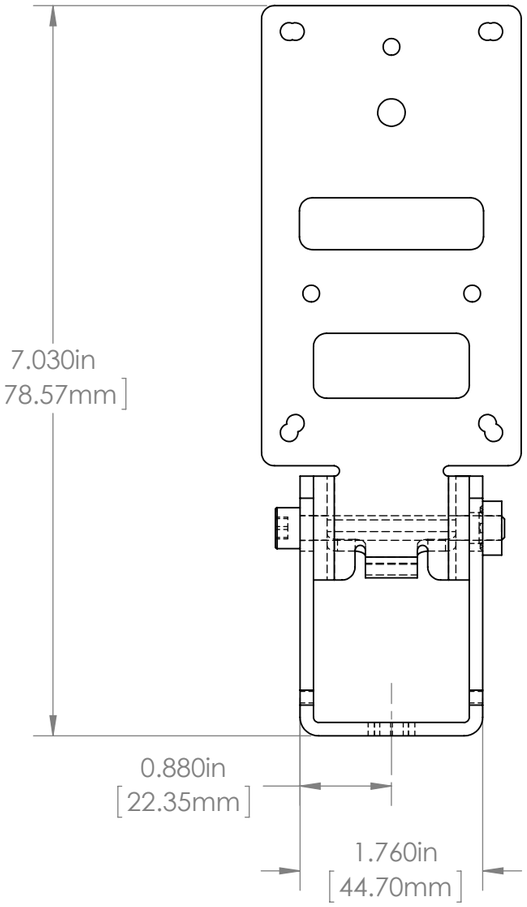
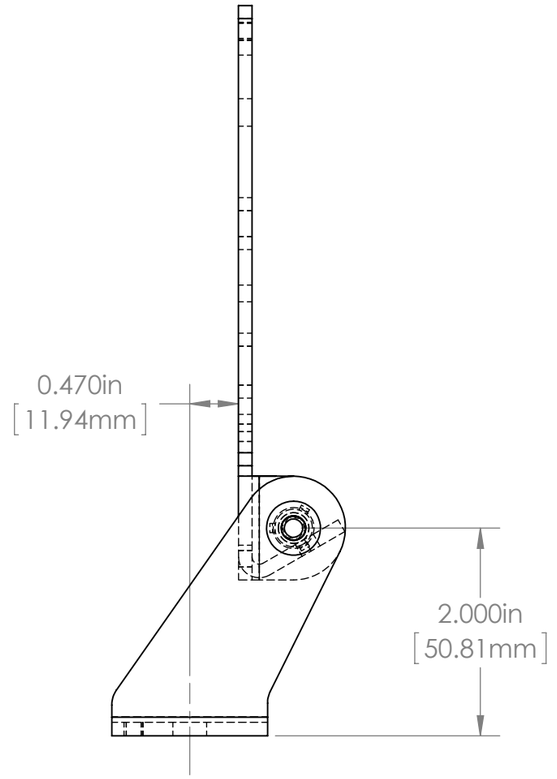
CU_NI-17XX_TRIPOD









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DIMENSIONS ARE IN INCHES
SURFACE FINISH:
TOLERANCES: .000= +/- 0.005"
.00= +/- 0.010"
LINEAR:

FINISH: BURNISHED

DEBUR AND BREAK SHARP EDGES

	NAME	SIGNATURE	DATE
DRAWN	SCHUBERT		5/2/2012
CHK'D			
APPV'D			
MFG			
Q.A			

NOTES:

Allison Park Group, Inc. (APG)
4055 Alpha Drive
Allison Park, PA 15101 USA

Phone +1 (412) 487-8211
Fax +1 (412) 486-3157

www.apgvision.com

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TITLE:
NI Smart Camera Pan and Tilt Mount

MATERIAL: 304 STAINLESS STEEL

DWG NO. 748182-01

A3

WEIGHT:

SCALE:1:2

SHEET 1 OF 2

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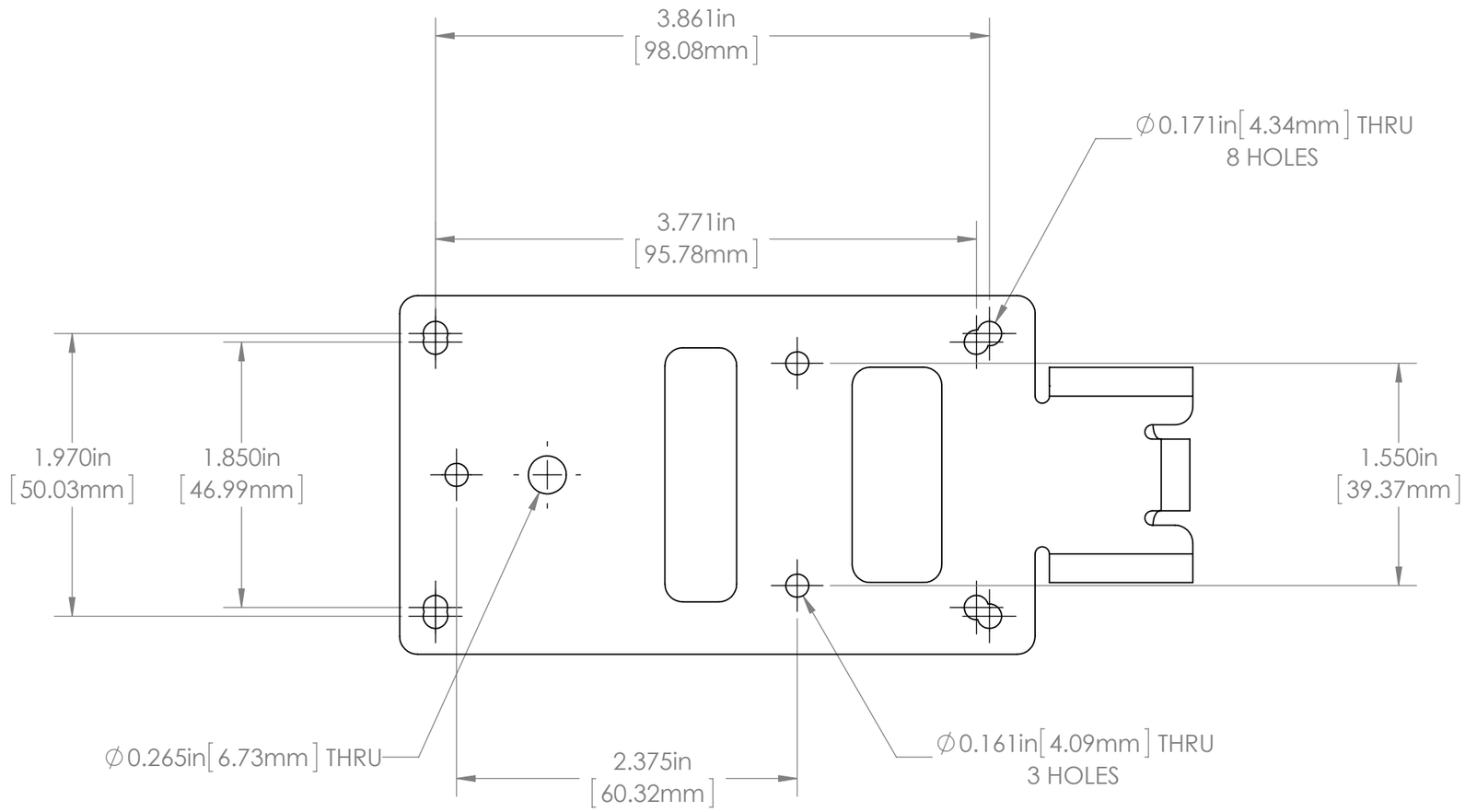

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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
SURFACE FINISH:
TOLERANCES: .000= +/- 0.005"
.00= +/- 0.010"
LINEAR:

FINISH: BURNISHED

DEBUR AND BREAK SHARP EDGES

	NAME	SIGNATURE	DATE
DRAWN	SCHUBERT		5/2/2012
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MATERIAL: 304 STAINLESS STEEL

WEIGHT:

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TITLE: NI Smart Camera Pan and Tilt Mount

DWG NO. 748182-01 | A3

SCALE:1:2 | SHEET 2 OF 2

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6

Power and I/O

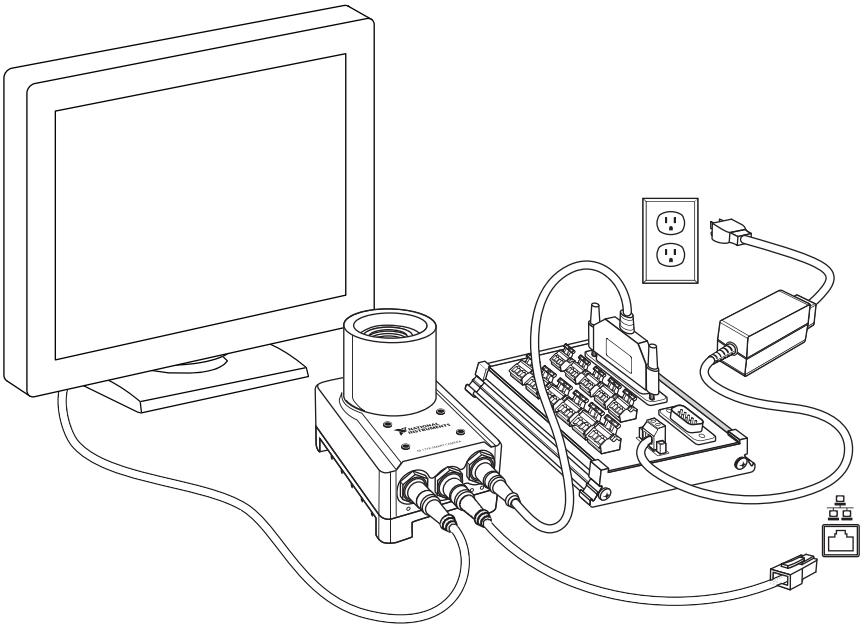
There are two options for connecting power and I/O to the NI 177x Smart Camera. The easiest method is to use the Starter Kit for NI 177x Smart Cameras, which includes the Power & I/O Accessory, the power supply, and the 3 cables you need: the M12 to DSUB, the M12 to RJ45, and the M12 to VGA/USB.

The second option is to use the M12 to Pigtail cable and the power supply for custom termination.

Using the Starter Kit

The following figure shows the complete setup using the Starter Kit.

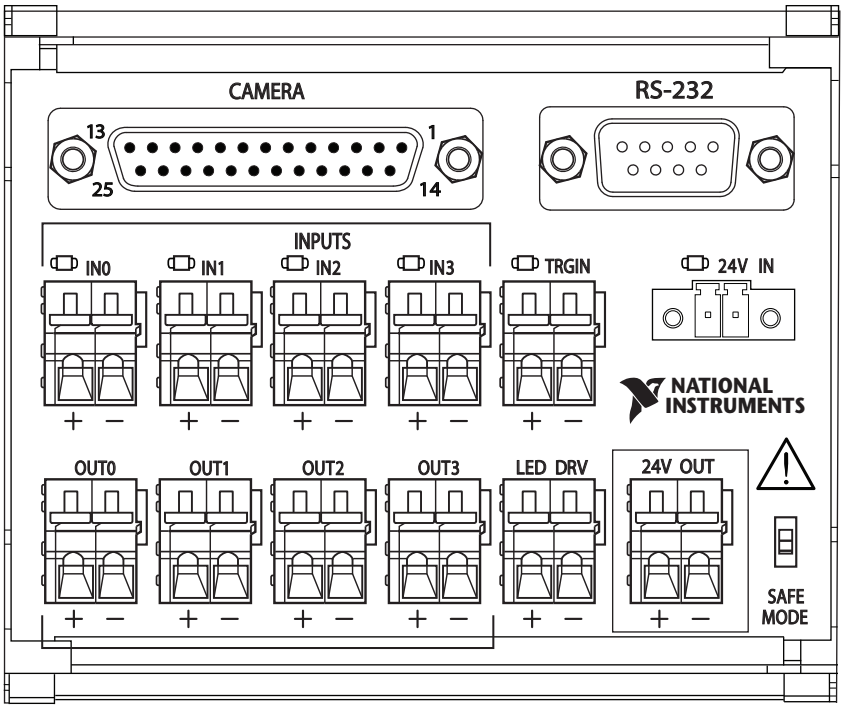
Figure 6-1. Connecting the NI 177x Smart Camera to the Power & I/O Accessory



Power & I/O Accessory for NI 177x Smart Cameras

The Power & I/O Accessory for NI 177x Smart cameras is a terminal block that simplifies power and I/O signal configuration. It uses a 25-pin D-SUB connector and a 17-pin M12 to 25-pin D-SUB cable. Provides spring termination for accessing digital I/O, trigger lines, direct drive LED output, 9-pin D-SUB for RS232, and 2-pin power connector. Refer to the *Power and I/O Accessory for NI 177x Smart Cameras User Guide* for operation instructions and specifications. The following figure shows the accessory.

Figure 6-2. Power & I/O Accessory for NI 177x Smart Cameras



Power Supply for NI 177x Smart Cameras

Use the 24 V power supply to connect to the Power & I/O Accessory.

Figure 6-3. Power Supply

Power Supply Specifications

Length ..... 2 m

Input Requirements

Input Voltage Range ..... 100 (-10%) VAC to 240 (+10%) VAC
Input Frequency Range ..... 47 Hz to 63 Hz
Input Power Consumption at no load ..... 0.3 W Max
Input In-rush Current ..... 50 A Max
Input Current ..... 0.8 A Max

Output Requirements

Output Voltage ..... +24 V
Output Regulation ..... 22.8 V to 25.2 V
Output Load Range ..... 0 to 1.25 A

Output Ripple and Noise	240 mV Max at 20 Mhz bandwidth with 10 UF/50 V capacitance and 104/50 V ceramic capacitor.
Efficiency	≥83.62% at average of 25/50/75/100% loads 115 and 230 VAC input
Line Regulation	2% Max
Hold Up Time	10 ms Min at 110 VAC full load
Turn On Time	2 s Max at 110 VAC full load

M12 to 25-pin DSUB Cable

The I/O connector is a 17-pin male M12 connector that provides power to the smart camera and transmits digital I/O signals. This cable is included with the Power & I/O Accessory for NI 177x Smart Cameras.

Figure 6-4. M12 to DSUB Cable

Using Custom Termination

You can use the power supply from above in conjunction with the M12 to Pigtail cable, which enables you to connect the smart camera power and I/O lines to custom termination. The following figure shows the M12 to Pigtail cable.

Figure 6-5. M12 to Pigtail Cable

Cable Specifications

General Data

Rated current at 40°C ..... 1.5 A
Rated voltage ..... 30 V
Number of positions 17
Volume resistance ..... ≤5 mΩ
Insulation resistance ..... ≥10 MΩ
Stripping length of the free conductor end ..... 35 mm
Ambient temperature (operation) ..... -25 °C to 90 °C (female)

General Characteristics

Standards/regulations ..... M12 connector IEC 61076-2-101
Coding ..... A - standard
Surge voltage category II
Pollution degree 3
Degree of protection IP65/IP68/IP69K
Torque ..... 0.4 Nm (M12 connector)
Contact material ..... CuZn
Contact surface material ..... Ni/Au
Contact carrier material ..... TPU GF
Material of grip body ..... TPU, hardly inflammable, self-extinguishing
Material, knurls ..... Zinc die-cast, nickel-plated
Sealing material ..... NBR
Status display ..... No

Conductor Data

Cable type ..... PVC black
Conductor cross section ..... 0.14 mm²
AWG signal line 26
Conductor structure signal line ..... 18x 0.10 mm
Core diameter including insulation ..... 1 mm ±0.05 mm
External cable diameter ..... 6.40 mm
Wire colors color-coded ..... DIN 47100
External sheath, color ..... Black RAL 9005
Overall twist ..... Wires twisted in layers
Outer sheath, material ..... PVC
Material conductor insulation ..... PVC
Conductor material ..... Bare Cu litz wires

Smallest bending radius,
movable installation..... 96 mm

Ambient temperature (operation) ..... -5 °C to 80 °C (cable, flexible installation)
-25 °C to 80 °C (cable, fixed installation)